



About Communication Towers

In the historic village of Mendham Borough, on the 100-acre campus of St. John Baptist Convent, a bell tower will rise. Not an ordinary tower, but a state-of-the-art cellular facility. To build here, in such an historically sensitive area, Bell Atlantic NYNEX financed the first stealth cellular tower in New Jersey. Designed by Edwards & Kelcy Wireless LLC, of Morristown, the 134-foot tower will conceal antennas and monitoring equipment for up to four carriers. "The tower will be constructed in a wooded area some distance from the convent buildings, and will hardly be visible from the road [Rte. 24]", assured Sister Barbara Jean, Assistant Superior of the convent's religious community.

A Historic Preservation Perspective

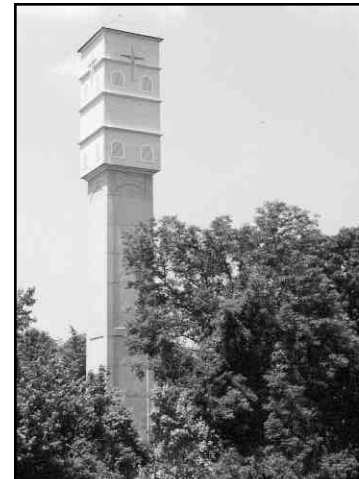
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Why would Bell Atlantic NYNEX pay for a specially-engineered tower three to five times the cost of a standard lattice tower? Aesthetics. The convent's close proximity to five National and New Jersey Register listed historic districts in the township and the Borough of Mendham, along with several individually-listed resources, had to be considered. The Borough's Board of Adjustment was anxious to keep modern visual intrusions minimal and preserve the relatively pristine natural environment esteemed by local residents. "Mendham is a residential town, with no commercial or industrial zones, so tower siting and design in keeping with the character of the area was imperative", said Richard Enright, a Bell Atlantic NYNEX engineer. The anticipated success story of the Mendham bell tower speaks volumes to the cellular industry: aesthetically-sensitive designs can be successful in preserving historic settings throughout NJ.

Communities and preservationists do not usually approve of modern towers constructed in the vicinity of historic resources. Their often negative view of towers is well founded. Whether it be the lattice observation tower at Gettysburg, or Fordham University's 480-foot radio tower next to the National Register-listed New York Botanical Garden (Bronx, NY) towers do not often aesthetically blend with their historic neighbors. Increasingly, historic cultural resources are being asked to sacrifice their viewsheds for the sake of communications towers. Although emissions are strictly regulated by the Federal Communications Commission (FCC) and the Federal Aviation Administration (FAA), tower designs are given wider latitude. While the wireless industry reports what cellular towers do for their customers, laypersons are often unsure how towers can impact the viewsheds of historic resources. Preservationists, planners, and cellular companies need to enter into

constructive dialogues about and implement proactive measures for protecting the integrity of these viewsheds.

In her article "Protecting Historic Structures Against Incompatible Development" (Preservation Law Reporter 1/95), preservationist Julia Hatch Miller argues that designating a district as historic is not enough - incompatible development outside the district's boundaries can still affect the integrity of the district. She advocates two solutions for local governments. First, revise preservation ordinances to include neighboring properties in designated areas that meet historic preservation criteria for eligibility. Second, establish buffer zones with design



**Bell Tower
located on the
campus of St.
John Baptist
Convent,
Mendham, NJ.**

controls to minimize the effects of incompatible development on historic resources. Fairfax County, Virginia's preservation ordinance imposes special design guidelines on land located in the viewshed of historic resources up to one quarter mile away. In these protected zones, called "Historic Overlay Districts", height and design guidelines are applied to all proposed construction, and all projects are reviewed by the County's Architectural Review Board.

While not using the same language, legislation relating to buffer zones exists in New Jersey. The 1985 amendment to New Jersey's Municipal Land Use Law (MLUL) includes "intervening or surrounding property significantly affecting or affected by the quality and character of the historic resource" within its definition of historic districts. Such intermediary zones extend protection to the viewsheds of historic resources. Robert Stipe, edi-

tor of New Directions in Historic Preservation (1976), suggests that historic resources with large areas of designated land form cultural landscapes, the entirety of which can be as significant as the resource itself, requiring reviewers of undertakings to consider the character of the place as a whole.

All FCC license applicants are required to identify historic resources in close proximity to their project site. When applicants do not comply with this requirement the project's potential effect on historic resources is not assessed. Since the FCC has jurisdiction over antenna license applications, any undertaking proposed near a historic resource is subject to a Section 106 review pursuant to the National Register of Historic Places Act (PL 89-665; 80 Stat. 915; 16 U.S.C. 470 as amended). When a project is proposed near a historic resource, the space in the vicinity of the project is called the Area of Potential Effect (APE). The Code of Federal Regulations (36 CFR 800) defines the APE as a geographic area within which an undertaking may cause changes in the character or use (ie: visual) to a historic resource. For example, in 1986, a license application was filed with the FCC for three, 297-foot radio towers in Ringwood, New Jersey. The applicant did not mention that the project site was within 2/3 of a mile from Ringwood Manor, a National Historic Landmark. Rising above the ridge line and the tree canopy, the towers would adversely affect the pristine viewshed of the Manor house. In September 1996, the FCC placed a stop-work order on the towers' construction, until necessary studies could be completed and evaluated. In December, the Borough of Ringwood determined the applicant to be in breach of a settlement agreement and consequently terminated the lease for the proposed construction site.

In 1990, the historic preservation consulting firm C.W. Zink & Co., of Trenton, prepared "Evaluation of Visual Impact on Historic Properties" as an attorney work product for Ebasco Environmental, Inc. of Lyndhurst, N.J. While the report evaluated a transmission line project, the four qualities affecting perception of historic cultural properties are applicable here. These are: (1) cultural significance, (2) authenticity, (3) context, and (4) access.

Assessing visual effects of one man-made construction on another is complex and often qualitative. As Zink and Co. make clear, visual impact involves "aesthetic and associational values", and is somewhat more subjective than an assessment based on strictly quantitative data. Some people may be more sensitive to visual intrusions than others.

Municipalities can neither control individual residents' responses to towers nor deny tower applications outright. Federal legislation and recent NJ court rulings in favor of wireless carriers have increasingly limited municipal regulatory authority. In February 1996, the Telecommunications Act (PL 104-104) was passed, mandating access to federal property for wireless

base stations. That month, the Department of the Interior supported increased usage of high elevation sites in national parks for wireless antenna towers. The U.S. Postal Service followed suit, offering its buildings as potential antenna sites.

In New Jersey, many municipalities and state agencies have offered water towers and other municipal properties as possible antenna locations. The New Jersey Department of Transportation and the New Jersey State Police have been approached by wireless companies interested in erecting antennas in interstate rest areas and in highway rights-of-way. In addition to providing more physical space for cellular antennas, a large volume of new wavelength frequencies was made available to the personal wireless telecommunications industry. Over a three-month period in 1995, the FCC auctioned off a spectrum of these frequencies to the cellular companies, which generated \$7.7 billion in revenues for the federal government.

The high population density, concentrated development, and rich cultural heritage of New Jersey can make responsible tower siting a challenge. An engineer with Bell Atlantic NYNEX recently said, "Providing service to customers without negatively impacting the community is a delicate balancing act". The FCC recently lifted the restriction on the number of cellular service providers in a cell site from two up to five. Currently, more than 24,000 cell sites, or geographic areas by which carriers monitor coverage, exist in this country. In addition to stimulating competition, this situation opens the door for new carriers to previously closed markets. To provide seamless coverage over the next decade, carriers anticipate adding 100,000 more antennas to the 22,000 antennas currently operating.

The increasing barrage of antenna applications, the growing demand for cellular service, the need for more cellular facilities, and municipal tower regulations have created unique opportunities nation-wide. Not surprisingly, a lack of uniformity exists in how municipal governments and preservationists have responded. Many municipalities have been scrambling to amend or revise their land use regulations and local ordinances, and impose design guidelines on new towers. To process antenna applications more expeditiously and to negotiate with cellular carriers more effectively, municipalities need to be prepared.

William M. Cox, General Counsel Emeritus for New Jersey Planning Officials, advocates prudent municipal planning and conditional use regulation for cellular towers. Cox encourages the inclusion of provisions for the locations of towers and antennas in the Master Plan. In Bernards Township, Somerset County, a Tower Task Force composed of Township residents pre-selected potential site locations for cellular towers. To assist in this planning, cellular carriers can forecast service needs, and can provide information about how many additional antennas they anticipate constructing in your area in the next few years.

As a possible solution to the inconsistencies in local land use legislation, the New Jersey Wireless Carriers Coalition has drafted a Model Land Use Ordinance relating to the siting of cellular facilities. The model ordinance addresses such issues as height limitations, conditional use, minimization of facility visibility, and co-location on existing structures or buildings. In addition to using this resource, municipalities can draft amendments to their land use legislation by studying communications tower ordinances which have already been enacted (examples on file at HPO). Some recurrent components are included here. In commercial and industrial zones, tower “forests” can be established and antenna siting on existing structures can be encouraged. In residential areas, conditions could include multiple antenna sitings on individual towers (co-location), height restrictions, minimum set-backs, and natural screening and landscaping around base stations. Specific design guidelines and design review can insure the compatibility of new tower construction.

During their application deliberation process, municipalities can evaluate the visual impact towers may have on the surrounding environment with line of sight studies. Municipalities can mandate such studies as a component of an environmental impact analysis. When a tower is proposed in a historic resource’s APE, a crane or balloon can be raised to the proposed height of the tower. A high-tech alternative is the computer-generated artist’s rendering, showing the tower’s elevation in relation to the proposed setting.

As a component of the municipal Master Plan, local governments can identify historic resources or districts deemed worthy of preservation.

To further protect these resources, local governments can adopt a preservation ordinance in accordance with the MLUL. A Historic Preservation Commission can be established, with powers to designate and protect the viewsheds of

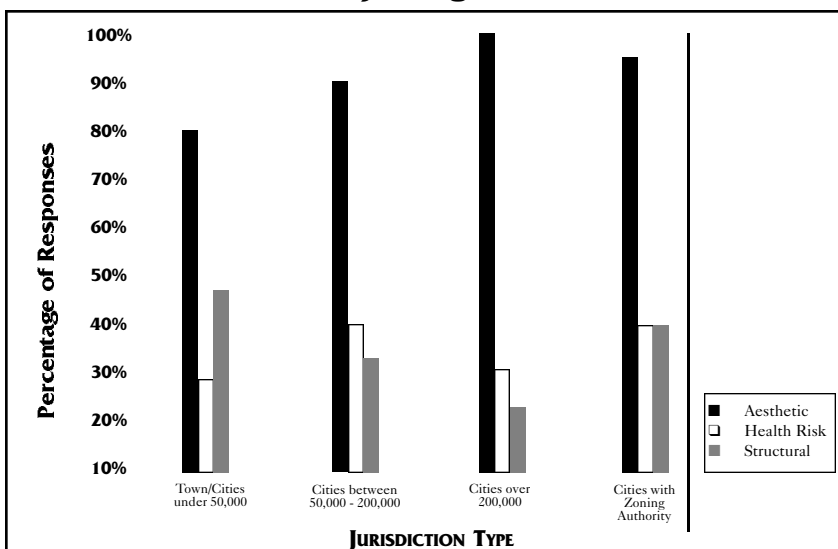
historic resources. The Commission should be invited to review all antenna applications which may impact historic resources, not just applications within historic districts. The FCC permits some regulation of communications towers in historic areas. Six months after the Telecommunications Act was passed, the FCC adopted a new Rule pursuant to the Act. The Rule (FCC 96-328) prohibits most private restrictions of locally-enacted regulations or ordinances that limit the installation, maintenance, or use of antennas receiving video programming (including wireless cable). Significantly, historic areas listed or eligible for listing on the National Register and which have integrity are excepted from the Rule. To further extend protection to the viewsheds of historic resources, municipalities can establish buffer zones with specific design and height requirements.

While a tower or antenna application in the vicinity of a historic resource is under consideration by the zoning board, the awareness and involvement of the public and the preservation community is important. Even if preservationists become involved in the review process after the tower is operational, there are ways to mitigate adverse effects to the viewsheds of historic resources. While complying with FCC and FAA requirements, neutral painting and medium intensity lighting can reduce the tower’s visibility. Sensitive colors such as green and blue, which blend with natural vegetation and the sky, can be used. In Charleston, South Carolina, camouflage painting was applied to a Sprint antenna constructed near the historic plantation of Drayton Hall on the Ashley River. To mitigate adverse effects, Sprint reduced the height of the monopole (90% of structure stands below tree canopy), and used non-obtrusive painting. Providing vegetation, landscaping, and compatible fencing can further reduce visibility of towers from pedestrians and street traffic.

Another possibility is to decrease the height of the tower, so that the structure will not protrude above a tree canopy, ridge line, or the landscape bordering a waterway. A general trend towards reducing tower height as a result of technology advancements has been observed by designers. Depending on technical limitations, carriers can reduce tower height by as much as 30 to 50 percent. At Machiasport, Maine, US Cellular reduced the tower’s height from 473 feet to 350 feet. By removing a red intermittent beacon and a set of side warning lights, the carrier eliminated 50% of the tower’s hazard lights while still complying with the FAA’s standards.

While it may not make sense everywhere, the use of concealment technology can minimize or eliminate visual obtrusiveness in historic and residential areas. Wireless providers like AT&T and Bell Atlantic NYNEX, who are sensitive to the aesthetic concerns of municipalities, will apply stealth design to towers in residential zones and historic areas. To meet the demand for such custom antennas, companies like Arcnet, Valmont and

Primary Siting Concerns



Courtesy of American Planning Association, Cellular Tower survey, November 1995.

Stealth Network Technologies, will construct a simulated pine tree, flag pole, or church steeple for about three to five times the cost of erecting a standard monopole. Antennas can even be concealed on the light poles in highway rights-of-way. In 1996, Cellular One constructed a 100-foot tall monopole resembling a tree at George Washington's 500-acre Mount Vernon estate. The brown and green alloy evergreen, complete with foliage and branches at the top, blends in with the surrounding trees. The stealth design reduced the antenna's visibility from neighboring communities, and from across the Potomac River. "The pole, which is camouflaged, absolutely fits in with that site", said Supervisor Gerald Hyland, of Mount Vernon Historic District.

Instead of constructing a new tower, carriers prefer attaching antennas to an existing structure, such as farm silos, water tanks, and other buildings and towers when possible. Depending on the limitations of the site and the needs of carriers, the structure may even be able to accommodate multiple antennas (co-location). Bell Atlantic NYNEX Mobile estimates that 70% of its 200 cell sites in New Jersey are co-located on existing structures. Offering space on standing utility structures for wireless can be economically and aesthetically beneficial.

One form of mitigation that is sometimes forgotten is the alternative site. The FCC requires that an applicant seeking a license for an antenna must demonstrate alternative site analysis as part of the selection process. If all alternative sites have been exhausted in favor of one site, the applicant must provide valid reasons why each alternative site proved unable to meet the carrier's technical and service requirements.

Preserving the integrity of viewsheds of historic resources is a complex issue that cannot be solved easily or quickly.

While the recommendations in this discussion can have universal applications, each municipality must respond individually to the challenges posed by towers. Despite some legislative hurdles, municipalities retain the right to insist on what is important to them. According to a member of a local Historical Society, "Cellular companies are like water, they prefer the route that offers the least resistance". For more information about periodical references, legislation, and surveys mentioned in this article, please contact the Historic Preservation Office.

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